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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/772,452	02/06/2004	Seung Jae Lee	030681-628	6721
21839	7590	06/04/2007		
BUCHANAN, INGERSOLL & ROONEY PC POST OFFICE BOX 1404 ALEXANDRIA, VA 22313-1404			EXAMINER MARTIN, ANGELA J	
			ART UNIT 1745	PAPER NUMBER
			MAIL DATE 06/04/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/772,452

Applicant(s)

LEE ET AL.

Examiner

Angela J. Martin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-46 is/are pending in the application.

4a) Of the above claim(s) 1-15, 18, 19, 21, 22, 25, 26, 28, 31-33, 35, 37, 39-44 and 46 is/are withdrawn from consideration.

- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.

- 6) ☒ Claim(s) 16, 17, 20, 23, 24, 27, 29, 30, 34, 36, 38 and 45 is/are rejected.

- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.

- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 06 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☒ All b) ☐ Some \* c) ☐ None of:

1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 2/6/04.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of Species I (claims 16, 17, 20, 23, 24, 27, 29, 30, 34, 36, 38, 45) in the reply filed on 3/12/07 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### ***Claim Objections***

2. Claim 16 is objected to because of the following informalities: The claim recites "The fuel cell" instead of "A fuel cell" since there is no antecedent basis for "the". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 30 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "arranged on the same side and face the same direction" in claim 30 is a relative term which renders the claim indefinite. The term "same side...same direction" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Appropriate correction is required.

***Claim Rejections - 35 USC § 102/103***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 16, 17, 20, 23, 24, 27, 29, 30, 34, 36, 38, 45 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Fuji et al., U.S. Pat. No. 6,406,809 B1.

Rejection of claims 16, 17, 20, 23, 24, 27, 29, 30, 34, 36, 38, 45 drawn to a fuel cell.

Fuji et al., teach a fuel cell comprising, a first, bipolar plate having a fuel flow field wherein the fuel flow field is formed in a reaction plate that protrudes above a surface of the first bipolar plate with a predetermined gap from the edge of the first bipolar plate; a second bipolar plate having an air flow field; and a membrane electrode assembly interposed between the first and second bipolar plates and in which reactions of a fuel and an oxidant take place (col. 2, lines 61-67 and col. 3, lines 1-38), wherein the fuel flow field has a length that is between three and eight times greater than the square root

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of the area of the first bipolar plate, and the air flow field has a length that is between three and eight times greater than the square root of the area of the second bipolar plate (Fig. 1). The fuel cell of claim 16, wherein the flow field is formed in a reaction plate that is recessed from a surface of the first bipolar plate with a predetermined gap from the edge of the first bipolar plate (col. 8, lines 35-55). The fuel cell of claim 16, wherein the fuel flow field comprises channels through which the fuel flows and a rib acting as a barrier between the channels, and the channels have a width that is between 1.3 and 2 times greater than the width of the rib. The fuel cell of claim 16, wherein the fuel flow field includes no more than sixty 90-degree turns (Fig. 3, 5, 7). The fuel cell of claim 16, wherein the fuel flow field includes no more than twelve 180-degree turns (Fig. 3, 5, 7). The fuel cell of claim 23, wherein the 90-degree turns are rounded (Fig. 3). The fuel cell of claim 24, wherein the 180-degree turns are rounded (Fig. 3). The fuel cell of claim 16, wherein the fuel flow field has an inlet and an outlet that are arranged on the same side and face the same direction (Examiner is interpreting "same side" as being on the same side of the plate and "same direction" as being an opening in the gravity direction)(Fig. 3). The fuel cell of claim 16, wherein the fuel flow field has an inlet and an outlet that are elliptical (Fig. 10). The fuel cell of claim 20, wherein the fuel flow field has an inlet and an outlet that are fan-shaped and have a width increasing away from the channels (Fig. 10). The fuel cell of claim 20, wherein the fuel flow field has an inlet and an outlet that have a 30-50% greater depth than the channels (Fig. 10). The fuel cell of claim 20, wherein each of the channels has a length

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that is between three and eight times longer than the square root of the area of the first bipolar plate (Fig. 1).

Thus, the claims are anticipated.

However, if the claims are not anticipated, in the alternative the claims are obvious because although the prior art of record does not recite "wherein the fuel flow field has a length that is between three and eight times greater than the square root of the area of the first bipolar plate, and the air flow field has a length that is between three and eight times greater than the square root of the area of the second bipolar plate", the Figures of the bipolar plates seem to have fuel flow field and air flow field lengths that are at least three times greater than the square root of the area of the bipolar plates.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wilkinson et al., U.S. Pat. No. 5,527,363, teach a fuel cell comprising, a first and second bipolar plate.

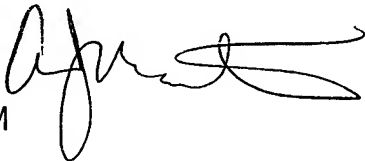
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela J. Martin whose telephone number is 571-272-1288. The examiner can normally be reached on Monday-Friday from 9:00 am to 5:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AJM

A handwritten signature in black ink, appearing to be 'AJM' followed by a stylized flourish.